

**Basil Dimitriadis**  
02/22/02 02:05 PM

To: WilliamL Johnson/RTP/USEPA/US@EPA  
cc: Dave Sanders/RTP/USEPA/US@EPA, Tom  
Helms/RTP/USEPA/US@EPA  
Subject: Re: Review of Methyl formate petition

Bill, Dave, Tom,  
thanks for the articles. They do show different KOH values for methyl formate, but still show the methyl formate to be 50% less reactive than ethane on a per-mole basis (and the same on a per-gram basis). Had that been the only evidence available, I would not necessarily conclude that methyl formate is less reactive than ethane (since there are several organic compounds for which the KOH values are lower than that for ethane but the MIT values are higher). However, since there are also MIR data that show a lower reactivity for methyl formate by a factor of 2.5 on a per-mole basis, I feel that a "negligible reactivity" rating for methyl formate is justified.

Basil

WilliamL Johnson

**WilliamL Johnson**  
02/20/2002 04:49 PM

To: Basil Dimitriadis/RTP/USEPA/US@EPA, Dave  
Sanders/RTP/USEPA/US@EPA  
cc:  
Subject: Re: Review of Methyl formate petition

Basil,

After reviewing your memo on theory of KOH ratios, it appears that the petitioner for the methyl formate exemption used an incorrect method to convert KOH on a molecule basis to a gram basis. By looking at the original Journal articles where the KOH for methyl formate is given (in units of cm<sup>3</sup>/molecule sec), it appears that methyl formate KOH is slightly less than the KOH of ethane, but not 2 or 3 times less. David Sanders will send you the Journal articles (which we received after we received the petition) and you can see the published values. I think you will probably want to revise your review of methyl formate memo to reflect the Journal article values, rather than the incorrect calculation by the petitioner. I regret that we did not send you the Journal articles to review at the beginning.

By the way, David Sanders is working on this so please carbon copy him on any correspondence regarding the methyl formate petition. Thanks.

Bill

Basil Dimitriadis

**Basil Dimitriadis**  
02/20/02 02:14 PM

To: Tom Helms/RTP/USEPA/US@EPA  
cc: WilliamL Johnson/RTP/USEPA/US@EPA, Deborah  
Luecken/RTP/USEPA/US@EPA  
Subject: Review of Methyl formate petition

Attached is my review.

Basil



Petition review for methyl formate.w

Long Smith

Methyl Formate

$$\frac{0.066 \text{ g ozone}}{\text{g}} \times \frac{60 \text{ g}}{\text{mole}} = \frac{3.96 \text{ g ozone}}{\text{mole}}$$

ethane

$$\frac{0.31 \text{ g ozone}}{\text{g}} \times \frac{30 \text{ g}}{\text{mole}} = \frac{9.3 \text{ g ozone}}{\text{mole}}$$

Methyl Formate

$$1.78 \times 10^9 \frac{\text{cm}^3}{\text{gm ozone}} \times \frac{60 \text{ g}}{\text{mole}} = \left( 1.068 \times 10^{11} \frac{\text{cm}^3}{\text{mole ozone}} \right) \left( \frac{\text{mole}}{6.02 \times 10^{23} \text{ molecules}} \right) =$$

$$2.28 \times 10^9 \frac{\text{cm}^3}{\text{gm ozone}} \times \frac{60 \text{ g}}{\text{mole}} = \left( 1.368 \times 10^{11} \frac{\text{cm}^3}{\text{mole ozone}} \right) \left( \frac{\text{mole}}{6.02 \times 10^{23} \text{ molecules}} \right) =$$

$1.77 \times 10^{-13} \text{ cm}^3/\text{molecule/second}$

$2.27 \times 10^{-13} \text{ cm}^3/\text{molecule/second}$

ethane

$$5.37 \times 10^9 \frac{\text{cm}^3}{\text{gm ozone}} \times \frac{30 \text{ g}}{\text{mole}} = 161.1 \times 10^9 \frac{\text{cm}^3}{\text{mole ozone}} \times \frac{\text{mole}}{6.02 \times 10^{23} \text{ molecules}} = 26.7 \times 10^{-14} \frac{\text{cm}^3}{\text{molecule/second}}$$

$$2.6 \times 10^{-13} \frac{\text{cm}^3}{\text{molecule/second}}$$